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Gestural representation of event structure in dyadic interaction

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Introduction

What are the underlying motivations for the conceptualization of events? Recent studies show, that people prefer the semantic order Agent-Patient-Act, or SOV when asked to gesture about transitive events[1-3]. This pattern is argued to reflect a "cognitively natural order" for the conceptualization of events. Here, we consider an alternative explanation.

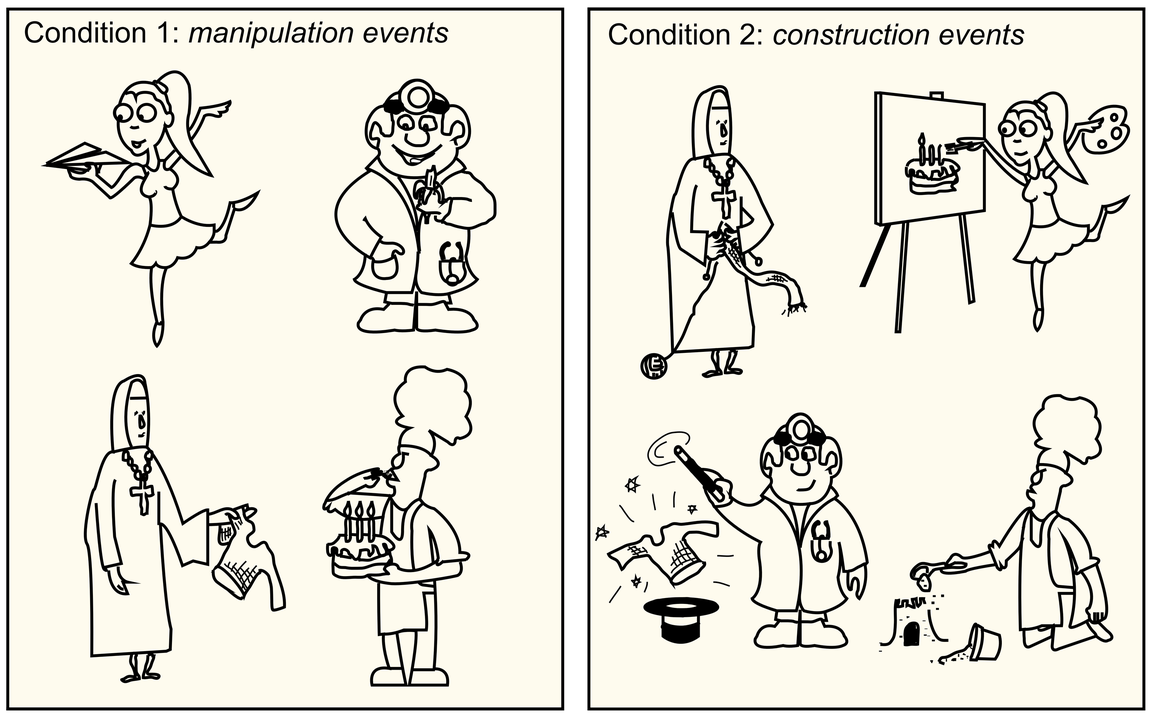
We designed a referential game in which pairs of participants used gesture to communicate about two types of transitive events: (i) *object manipulation events,* and (ii) *construction events*. These have inherently different logical and sequential structure: in manipulation events, the objects must precede the action while in construction events, objects appear as a consequence of the action. Accordingly, we hypothesized different gesture orders.

Figure 1: *Experimental setup*

Methods

- 25 dyads (n = 50) , all native speakers of Danish, participated in the experiment.
- Participants took turns in matching and referring to stimulus images using only gesture.
- Two conditions: *Object manipulation events* and *object construction events*.
- The stimulus orders were randomized for each dyad and the condition order was counterbalanced

Figure 2: *Example of stimulus images*



Stimuli

Two sets of pictorial stimuli were created for the experiment – one for each of the two conditions.
Each set contained 16 images depicting either object manipulation or construction events.
The images were created combinatorially (4 agents, objects and actions), to give 'near-minimal' pairs. This forced participants to disambiguate images clearly by including all semantic elements

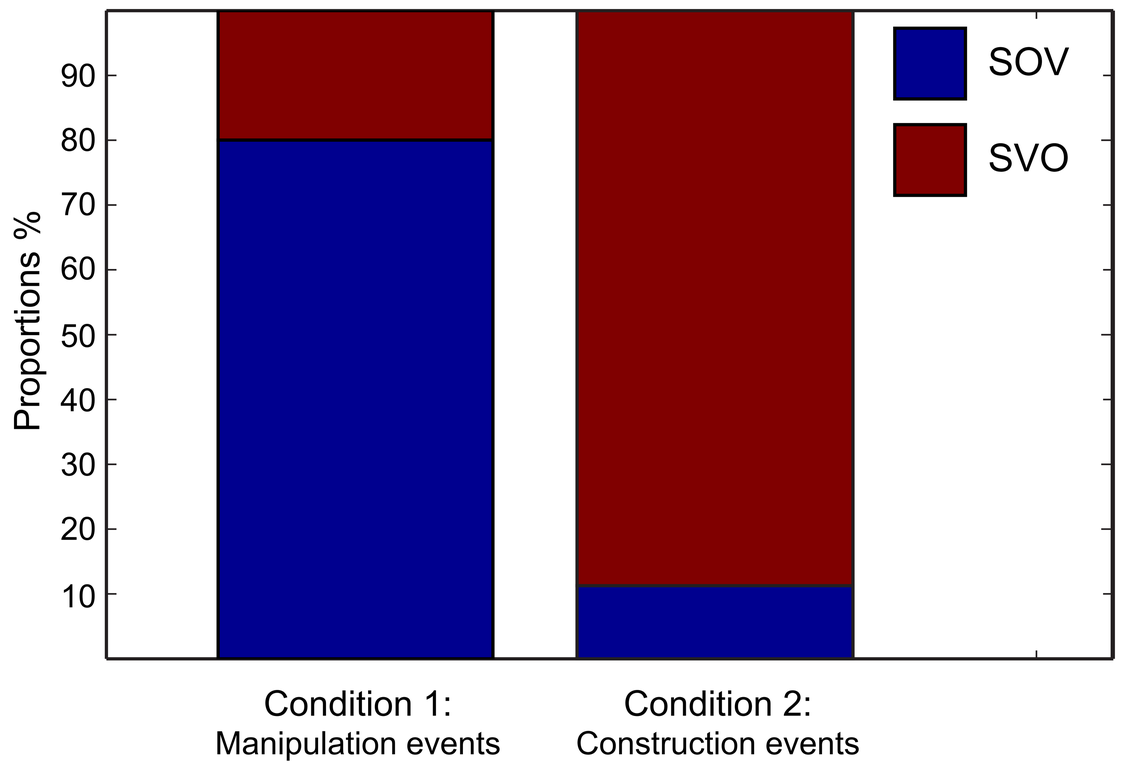
Results

The experiment elicited 2381 gesture strings coded as either SOV or SVO.

Following our predictions, participants produced a significantly larger proportion of SOV gestures in response to manipulation events compared to construction events (wM = .80 vs. wM = .11), $t(49) = 5.375$, $p < .000$ (onetailed).

Our findings indicate that participants prefer the SOV order for object manipulation events and the SVO order for object construction events.

Figure 3: *Proportions of Gesture Orders*



Conclusions

We argue that overt gesture can reveal motivational sources in the conceptualization of events. Participants produce gesture strings that iconically reflect the inherent logical and sequential structure of the perceived events. This indicates that the motivation for conceptual structure in gesture is not isolated to the cognitive domain, but influenced by external factors, i.e. experiential structure in the physical world.

Further questions

A number of potential follow-up experiments would allow us to address the question: under which condition, if at all, will dyads choose a single gesture order for communication?
Movement data was collected for 13 dyads. What can such data tell us about the evolution of gestural sign systems within dyads?

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